

## DIET COMPOSITION OF RED BANDFISH, *CEPOLA MACROPHTHALMA* (ACTINOPTERYGII: PERCIFORMES: CEPOLIDAE), FROM THE AEGEAN SEA OF TURKEY

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**Background.** The red bandfish, *Cepola macrophthalma* (Linnaeus, 1758), is a benthic fish usually not exceeding 450 cm in length. It occurs in the eastern Atlantic from the British Isles to the north of Senegal and is also common throughout the Mediterranean Sea. The red bandfish has no commercial value and is often represented in the discarded catch. The knowledge of the feeding ecology, of non-commercial as well as commercial species, is essential for implementing a multispecies approach to fishery management. Studies on red bandfish feeding biology have been rather scarce and the majority of them lacked taxonomical approach. The presently reported study constitutes the first report on the diet of *Cepola macrophthalma* from two bays on the Turkish coast.

**Material and methods.** The study was based on the specimens of *Cepola macrophthalma* collected in İzmir Bay and Sığacık Bay from May 2005 to June 2006. The following basic parameters were calculated, based on the data collected during the analysis of red bandfish diet: relative number of food items in the gut content, frequency of occurrence, and relative weight of total gut content. Principal food items were determined using the index of relative importance (%IRI). The differences in the diet composition were tested for length groups and seasons by using the Bray–Curtis similarity index for both areas studied.

**Results.** A total of 380 stomachs were examined in two bays. According to the analyses a total of 18 different prey species belonging to nine major systematic groups were found, i.e., Anthomedusae, Siphonophora, Polychaeta, Crustacea, Mollusca, Chaetognatha, Appendicularia, Thaliacea, and Actinopterygii. Concerning overall diet composition, crustaceans (especially copepods) were the most important prey in terms of %IRI, %N, %F, and %W in all seasons. In this study, a total of 80 taxa were found and identified. According to the Bray–Curtis similarity index, the diet of the red bandfish was similar within all seasons for both areas.

**Conclusion.** Stomach content analysis of red bandfish showed that it is a zooplanktophagous species. In addition to bottom species it feeds also on pelagic organisms. This fact indicates ontogenetically based food preferences of the species.

**Keywords:** stomach content, feeding ecology, index of relative importance, zooplanktophage, İzmir Bay

### INTRODUCTION

The red bandfish, *Cepola macrophthalma* (Linnaeus, 1758), is a zooplanktophagous benthic species found solitary or in small groups at depths ranging from 10 to 450 m, with an “optimal depth window” between 60 and 120 m (Stergiou 1993). It occurs in both temperate and subtropical waters and is known to be distributed in the eastern Atlantic from the British Isles to the north of Senegal (Bauchot 1987). It is also common throughout the Mediterranean Sea, as well as in Turkish seas, but not in the Black Sea (Tortonese 1986, Bauchot 1987). The red bandfish has economical importance in Spain and Italy (Tortonese 1986, Bauchot 1987), but no commercial value in Turkey (Düzbastılar 2014).

Although biological aspects of the red bandfish have been studied by several authors (Atkinson 1976, Martín and Sabatés 1991, Stergiou et al. 1992, 1996, Stergiou 1993, 1999, Stergiou and Papaconstantinou 1993, Vallisneri et al. 2006, Dulčić et al. 2008, Giacalone et al. 2010) in the Mediterranean Sea, a few of them are related to the feeding of red bandfish. In the above-mentioned studies prey items were generally not evaluated in relation to the exact specific identity or the sampling season. Even though the species is distributed in all Turkish seas except the Black Sea, the relevant studies were scarce and there have only been two reports on its age and growth properties (Kaya et al. 2001, Leblebici unpublished\*\*).

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\*\* Leblebici S. 2007. İzmir Körfezi’nde Yaşayan Kurdela Balığı, *Cepola macrophthalma* (Linnaeus, 1758) Türünün Biyolojik Özelliklerinin Araştırılması. [Investigations on the biological properties of red bandfish *Cepola macrophthalma* (Linnaeus, 1758) in İzmir Bay.] PhD Thesis. Ege University, İzmir, Turkey. [In Turkish.]

The purpose of the presently reported study was to improve the knowledge on the feeding habits of the red bandfish by analysing the qualitative and quantitative variations of the food items in the stomach contents according to length groups and according to seasons in two bays of the Aegean Sea.

## MATERIAL AND METHODS

Specimens of the red bandfish, *Cepola macrophthalmalma* (total lengths ranging between 11 and 42.2 cm), were collected by trawl in the İzmir Bay and Sığacık Bay, Turkish Aegean Sea from May 2005 to June 2006 (Fig. 1).

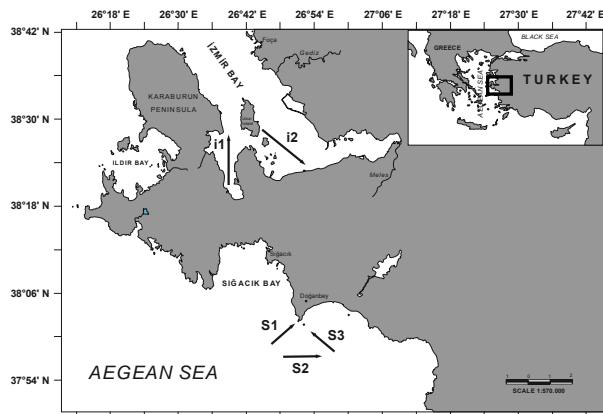


Fig. 1. Research area and trawling locations

The samples were collected seasonally by a research vessel—R/V *Egesüf* (27 m length, 373 kw) in İzmir Bay and by a commercial trawler—F/V *Hapuloğlu* (23 m length, 410 kw) in Sığacık Bay. The sampling depth ranged between 45 and 70 m in İzmir Bay, and 145–296 m in Sığacık Bay. The fish stomachs were removed immediately after capture and were stored in 4% buffered formalin solution until the contents were analysed. In the laboratory the stomach contents were assigned to group- or species level with a SZX7 Olympus stereo microscope. The identification of digested copepods was done from body part by following the methods of Rose (1933) and Brodskii (1967). Once counted, the individuals of the same species were weighed together (wet weight to the nearest 0.0001 g) after excess moisture was removed by blotting prey items on tissue paper.

For a quantitative description of the diet, Hyslop (1980) equations were used; relative number of total gut content (%N), frequency of occurrence (%F), and relative weight of total gut content (%W). Main food items were determined using the index of relative importance (IRI) (Pinkas et al. 1971):

$$\text{IRI} = \%F \times (\%N + \%W)$$

The index of relative importance (IRI) was calculated and expressed as a percentage:

$$\text{IRI}\% = 100 \times \text{IRI} \cdot (\sum \text{IRI})^{-1}$$

%IRI was computed in order to determine ratios of food groups in the stomach to overall food groups. Subsequently, food items were grouped into categories of preference using the method proposed by Morato-Gomes (unpublished\*). The categories were defined as follows:

$\text{IRI} \geq 30 \times (0.15 \times \sum \%F)$  .....main important prey (MIP)  
 $30 \times (0.15 \times \sum \%F) > \text{IRI} > 10 \times (0.05 \times \sum \%F)$  .....  
 .....secondary prey (SP)  
 $\text{IRI} \leq 10 \times (0.05 \times \sum \%F)$  ..... occasional prey (OP)

Seasonal differences in the diet composition for each bay were determined by the Bray–Curtis similarity index, using percentage numerical data (Washington 1984).

## RESULTS

A total of 380 stomachs of red bandfish, *Cepola macrophthalmalma*, were examined, including 180 from İzmir Bay and 200 from Sığacık Bay. Only 7 stomachs (1.84%)—all of them collected in winter—were empty. According to the analyses a total of 18 different prey species was found belonging to the nine major systematic groups, Anthomedusae, Siphonophora, Polychaeta, Crustacea, Mollusca, Chaetognatha, Appendicularia, Thaliacea, and Actinopterygii. Pelagic copepods (Copepoda) were found to be most important prey group (MIP) in the diet for all length groups and seasons in each bay. Secondary prey groups (SP) were determined as decapod larvae, Appendicularia, Cladocera, Cirripedia larvae, Chaetognatha, and Bivalvia and it has been found that the sequence of their abundance changed by seasons and length groups, whereas Siphonophora, Isopoda, Mysidacea, Amphipoda, and Ostracoda were rare and rated as occasional prey groups (OP) (Tables 1–5).

Considering the overall diet composition, crustaceans (especially copepods) were the most important prey items in terms of %IRI, %N, %F, and %W in all seasons and length groups for each bay. The remaining portion of the diet was shared by decapod larvae, Chaetognatha, Appendicularia, Cladocera, Cirripedia larvae, Brachyura larvae, Ostracoda, Mysidacea, Bivalvia, Anthomedusae, Siphonophora, fish larvae and eggs, Thaliacea, Polychaeta, Amphipoda, Isopoda, and Gastropoda (Tables 1–4). In the presently reported study, covering all seasons, a total of 80 taxa were determined (Tables 1 and 2). There were 69 taxa in the fish from İzmir Bay 69 and 67—from Sığacık Bay.

The diet of red bandfish for all seasons was made up mainly of pelagic copepods for both bays as the main food item (Tables 1 and 2). The abundance of pelagic copepod species changed by seasons. In İzmir Bay, the dominant food items were: *Oncaea media*, *Corycaeus typicus*, *Acartia clausi*, and *Clausocalanus arcuicornis* (in spring); *Centropages typicus* and *Ditrichocorycaeus brehmi* (in summer); *Ditrichocorycaeus brehmi*, *Temora stylifera*, *Oncaea media*, and *Euterpina acutifrons* (in autumn); and *Temora stylifera*, and *Paracalanus parvus* (in winter). In Sığacık Bay, the dominant food items were: *Corycaeus typicus* and *Oncaea media* (in spring); *Centropages typicus*, *Ditrichocorycaeus brehmi*, *Corycaeus giesbrechti* (in summer); *Ditrichocorycaeus brehmi*, *Paracalanus*

\* Morato-Gomes T. 1995. Ecologia alimentar de *Serranus atricauda* (Günther, 1874) dos Açores. „Licenciatura” Thesis, Universidade do Algarve, Faro, Portugal.

**Table 1**  
Diet composition of red bandfish, *Cepola macrophthalma*, in the İzmir Bay in sampling periods

Prey Item	Spring (n = 48)				Summer (n = 48)				Autumn (n = 44)				Winter (n = 36)								
	%N	%W	%F	IRI	%IRI	%N	%W	%F	IRI	%IRI	%N	%W	%F	IRI	%IRI	%N	%W	%F	IRI	%IRI	
Siphonophora	0.37	1.30	25.00	41.91	0.61																
Anthomedusae	3.14	1.23	66.67	291.53	4.21																
Polychaeta						0.03	0.75	8.33	0.28	0.00											
Crustacea																					
Cladocera																					
<i>Podon intermedius</i>						1.45	4.67	58.33	85.99	0.94	0.60	3.05	63.64	232.29	1.70	0.80	0.60	50.00		70.10	0.42
<i>Penilia avirostris</i>						0.03	2.85	8.33	0.37	0.00											
Ostracoda	0.64	0.90	33.33	51.24	0.74	0.12	0.36	25	3.01	0.03	0.07	1.00	18.18	19.47	0.14	0.08	1.12	16.67		20.06	0.12
Copepoda	83.17	73.29	91.67	14342.22	84.91	83.64	58.75	100.00	14239.79	79.13	87.89	71.00	100.00	15888.40	88.89	80.94	85.06	100.00		16600.20	87.32
Calanoida	16.45	3.26	75.00	1478.48	21.37	11.06	5.52	100.00	1109.12	12.11	14.74	4.52	100.00	1925.51	14.09	26.53	2.76	100.00		2929.36	17.73
<i>Acartia clausi</i>	5.86	2.35	33.33	273.47	3.95	0.59	2.35	41.67	25.17	0.27	1.99	3.25	81.82	429.14	3.14	0.08	0.14	16.67		3.77	0.02
<i>Calocalanus pavo</i>	0.16	0.10	8.33	2.18	0.03																
<i>Calocalanus plumulosus</i>	0.11	3.29	8.33	28.29	0.41																
<i>Paracalanus parvus</i>	0.37	1.74	25.00	52.78	0.76	0.83	2.66	33.33	28.08	0.31	2.26	2.41	81.82	381.85	2.80	12.72	54.20		91.67	6133.94	37.12
<i>Ctenocalanus vanus</i>																0.04	0.75	8.33		6.62	0.04
<i>Clausocalanus arcuicornis</i>	5.17	3.32	25.00	212.06	3.07						0.07	4.60	18.18	84.83	0.62	0.13	0.04	16.67		2.79	0.02
<i>Clausocalanus furcatus</i>	1.86	1.71	25.00	89.33	1.29						0.53	2.37	63.64	184.61	1.35	0.17	0.71	25.00		21.83	0.13
<i>Clausocalanus</i> spp.	11.29	4.45	16.67	262.27	3.79						0.46	6.17	45.45	301.39	2.21	1.81	1.00	41.67		116.70	0.71
<i>Nannocalanus minor</i>	0.75	1.54	33.33	76.03	1.10						1.47	1.34	75.00	210.64	1.27	1.47	1.34	75.00		210.64	1.27
<i>Diatixis pygmaea</i>											0.08	0.19	8.33	2.28	0.01	0.08	0.19	8.33		2.28	0.01
<i>Temora stylifera</i>	0.91	4.29	16.67	86.55	1.25	2.25	2.91	100.00	226.34	2.47	16.16	5.94	90.91	2009.84	14.71	19.44	5.46	100.00		2489.49	15.07
<i>Aetideus giesbrechti</i>																0.04	0.42	8.33		3.86	0.02
<i>Euchaeta marina</i>											0.08	0.09	16.67	2.88	0.02	0.08	0.09	16.67		2.88	0.02
<i>Centropages typicus</i>	3.19	1.71	50.00	245.21	3.54	22.60	12.89	100.00	2266.56	24.75	3.85	2.37	100.00	621.99	4.55	0.55	0.88	66.67		94.85	0.57
<i>Centropages kroeyeri</i>						0.43	2.43	27.27	78.05	0.57											
<i>Centropages violaceus</i>						0.03	2.99	9.09	27.51	0.20											
<i>Candacia ethiopia</i>	0.48	1.03	25.00	37.69	0.54											0.21	0.84	16.67		17.42	0.11
<i>Candacia armata</i>	0.11	1.38	16.67	24.71	0.36						1.30	1.23	75.00	189.60	1.15						
<i>Candacia bispinosa</i>	0.69	1.75	33.33	81.50	1.18																
<i>Candacia simplex</i>																0.55	1.20	25.00		43.72	0.26
<i>Candacia</i> sp.	0.05	0.52	8.33	4.79	0.07																
<i>Lucicutia flavicornis</i>	1.60	2.13	25.00	93.17	1.35																
<i>Lucicutia</i> sp.	0.59	1.64	16.67	37.04	0.54																
<i>Isias clavipes</i>	1.54	1.78	25.00	83.15	1.20	0.21	0.13	41.67	8.66	0.09	0.10	2.47	27.27	70.09	0.51	2.52	1.43	66.67		263.13	1.59
<i>Labidocera wollastoni</i>						0.03	0.73	8.33	0.28	0.00	0.03	2.99	9.09	27.51	0.20	0.42	0.99	25.00		35.23	0.21
<i>Pleuromamma abdominalis</i>	0.43	0.72	16.67	19.17	0.28											0.17	1.50	33.33		55.57	0.34
<i>Pleuromamma gracilis</i>	0.27	0.93	8.33	9.94	0.14																
<i>Corycaeus clausi</i>	3.51	2.45	58.33	347.82	5.03	0.12	0.94	16.67	2.06	0.02	0.03	3.39	9.09	31.16	0.23	0.50	1.05	50.00		77.63	0.47

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**Table 2**  
Diet composition of red bandfish, *Cepola macrophthalmia*, in the Sığacık Bay in sampling periods

Prey Item	Spring (n = 60)				Summer (n = 50)				Autumn (n = 42)				Winter (n = 45)								
	%N	%W	%F	IRI	%N	%W	%F	IRI	%N	%W	%F	IRI	%N	%W	%F	IRI					
Siphonophora	0.08	0.31	5.00	1.94	0.02																
Anthomedusae																					
Polychaeta																					
Crustacea																					
Cladocera																					
<i>Podon intermedius</i>	7.72	2.53	45.00	461.12	5.04	3.90	3.74	82.00	626.48	4.02	1.42	2.69	7.14	29.37	0.17	1.42	0.35	26.67	47.21	0.52	
<i>Pleopis polyphemoides</i>	0.08	0.13	5.00	1.06	0.01																
Ostracoda						0.16	0.72	34.00	30.01	0.19							0.08	2.30	6.67	15.92	0.18
Copepoda	83.05	64.27	95.00	13995.72	89.77	90.70	70.65	100.00	16134.59	85.67	86.00	78.37	100.00	16437.44	90.90	83.47	56.23	100.00	13970.05	84.19	
Calanoida	30.47	11.13	90.00	3744.22	40.90	6.31	3.44	82.00	799.31	5.13	19.19	8.09	100.00	2727.78	19.34	19.37	8.79	66.67	1876.75	20.75	
<i>Acartia clausi</i>	0.56	1.14	20.00	34.02	0.37	0.48	0.64	50.00	55.91	0.36	2.46	3.38	78.57	458.57	3.25	0.17	0.04	6.67	1.37	0.02	
<i>Acartia negligens</i>						0.38	2.80	28.57	91.04	0.65											
<i>Calanus</i> sp.	0.08	0.13	5.00	1.06	0.01												0.25	0.39	6.67	4.27	0.05
<i>Calocalanus contractus</i>																					
<i>Calocalanus</i> spp.	0.08	0.07	5.00	0.73	0.01																
<i>Paracalanus parvus</i>	0.64	0.07	15.00	10.54	0.12	1.28	4.59	74.00	434.43	2.79	7.76	4.79	92.86	1165.46	8.26	10.77	3.71	60.00	868.65	9.60	
<i>Paracalanus nanus</i>											1.59	1.96	64.29	228.22	1.62	0.58	0.08	13.33	8.83	0.10	
<i>Ctenocalanus vanus</i>	0.08	0.29	5.00	1.83	0.02												0.08	0.51	6.67	3.94	0.04
<i>Clausocalanus arcuicornis</i>	0.95	0.86	25.00	45.32	0.50						0.11	1.53	7.14	11.68	0.08	0.25	0.16	6.67	2.71	0.03	
<i>Clausocalanus furcatus</i>	0.64	0.20	15.00	12.52	0.14	0.05	0.68	18.00	13.20	0.08	0.11	2.29	14.29	34.26	0.24	1.00	1.76	26.67	73.57	0.81	
<i>Clausocalanus</i> spp.	3.74	0.73	35.00	156.28	1.71	0.48	2.46	50.00	147.25	0.95	1.20	3.26	57.14	255.10	1.81	1.00	0.08	40.00	43.19	0.48	
<i>Nannocalanus minor</i>	0.32	1.41	5.00	8.63	0.09												0.33	0.55	26.67	23.48	0.26
<i>Diatixis pygmaea</i>						0.11	4.59	18.00	84.51	0.54	0.11	2.10	7.14	15.77	0.11	0.17	0.04	13.33	2.75	0.03	
<i>Temora stylifera</i>	0.56	0.48	30.00	31.23	0.34	4.22	4.97	96.00	882.49	5.67	2.46	3.41	92.86	545.48	3.87	11.27	14.84	53.33	1392.36	15.40	
<i>Euchaeta marina</i>																	0.08	0.74	6.67	5.50	0.06
<i>Centropages typicus</i>	2.07	2.93	45.00	224.76	2.46	25.17	9.56	94.00	3264.80	20.96	1.64	2.04	64.29	236.64	1.68	0.17	0.62	13.33	10.56	0.12	
<i>Centropages violaceus</i>						0.05	1.43	7.14	10.61	0.08											
<i>Candacia ethiopic</i>	0.32	1.89	15.00	33.16	0.36																
<i>Candacia armata</i>	0.08	0.46	15.00	8.12	0.09																
<i>Candacia bispinosa</i>	0.72	3.81	30.00	135.67	1.48																
<i>Candacia simplex</i>	0.24	1.39	5.00	8.12	0.09																
<i>Candacia</i> sp.	0.16	0.84	10.00	9.95	0.11																
<i>Lucicutia flavicornis</i>	1.19	0.51	10.00	16.99	0.19																
<i>Isias clavipes</i>	0.40	0.22	20.00	12.36	0.13	0.59	1.66	34.00	76.32	0.49	0.16	1.81	14.29	28.23	0.20	0.92	0.51	26.67	38.02	0.42	
<i>Pleuromamma abdominalis</i>	0.56	0.75	5.00	6.52	0.07												0.33	1.44	20.00	35.57	0.39
<i>Corycaeus clausi</i>	1.43	1.54	40.00	118.89	1.30												0.25	3.08	20.00	66.70	0.74

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Table 2 cont.

Prey Item	Spring (n = 60)				Summer (n = 50)				Autumn (n = 42)				Winter (n = 45)							
	%N	%W	%F	IRI	%IRI	%N	%W	%F	IRI	%IRI	%N	%W	%F	IRI	%IRI					
<i>Corycaeus flaccus</i>	0.48	10.08	15.00	158.32	1.73	5.67	1.91	74.00	560.70	3.60	1.86	2.73	42.86	196.56	1.39	2.92	4.18	33.33	56.64	0.63
<i>Corycaeus giesbrechti</i>	0.32	0.29	15.00	9.06	0.10	1.60	1.49	58.00	179.23	1.15	0.27	0.53	28.57	23.07	0.16			13.33	94.66	1.05
<i>Corycaeus ovalis</i>	7.64	3.43	65.00	719.52	7.86	5.13	6.07	76.00	851.63	5.47	4.87	4.37	92.86	857.42	6.08	2.09	2.23	20.00	86.25	0.95
<i>Corycaeus typicus</i>	2.39	1.65	40.00	161.47	1.76	23.94	12.87	92.00	3387.08	21.75	17.39	3.95	100.00	2133.47	15.13	7.43	2.19	53.33	512.84	5.67
<i>Ditrichocorycaeus brehmi</i>	0.08	3.52	5.00	18.00	0.20															
<i>Urocorycaeus fuscifer</i>																				
<i>Onchocorycaeus latus</i>	0.95	0.18	35.00	39.57	0.43						0.22	3.89	7.14	29.35	0.21					
<i>Farranula rostrata</i>	8.51	3.59	60.00	725.92	7.93	9.35	3.99	98.00	1307.96	8.40	12.08	1.96	92.86	1304.42	9.25	4.76	1.13	46.67	274.88	3.04
<i>Corycaeus</i> spp.	0.08	0.22	5.00	1.50	0.02															
<i>Vetтория parva</i>	0.08	0.02	5.00	0.51	0.01															
<i>Oithona nana</i>	0.16	1.63	10.00	17.87	0.20						0.05	1.13	7.14	8.43	0.06					
<i>Oithona plumifera</i>	13.60	2.71	55.00	897.05	9.80	1.98	0.64	98.00	256.25	1.65	4.81	5.61	92.86	967.46	6.86	15.53	2.34	46.67	833.87	9.22
<i>Oncaea media</i>	0.56	0.95	30.00	45.09	0.49						0.55	1.03	50.00	78.83	0.56	0.83	0.16	33.33	33.03	0.37
<i>Oncaea mediterranea</i>	0.24	0.42	15.00	9.85	0.11						0.05	0.48	7.14	3.80	0.03					
<i>Triconia conifera</i>																				
<i>Oncaea</i> spp.																				
<i>Lubbockia squillimana</i>	0.40	1.36	5.00	8.81	0.10															
<i>Lubbockia aculeata</i>	1.59	2.97	25.00	114.03	1.25															
<i>Sapphirina metallina</i>	0.16	0.11	5.00	1.35	0.01															
<i>Sapphirina nigromaculata</i>	0.48	0.02	15.00	7.49	0.08						0.21	3.61	26.00	99.44	0.64	1.75	2.33	78.57	320.30	2.27
<i>Microsetella</i> spp.	0.08	0.31	5.00	1.94	0.02						3.85	2.68	76.00	495.86	3.18	4.37	2.92	85.71	625.04	4.43
<i>Euterpina acutifrons</i>											0.05	1.78	16.00	29.40	0.19					
<i>Microsetella norvegica</i>											0.21	3.02	32.00	103.36	0.66	0.11	2.86	14.29	42.43	0.30
<i>Caligus</i> sp.	0.16	0.62	5.00	3.88	0.04						0.21	3.02	32.00	103.36	0.66	0.11	2.86	14.29	42.43	0.30
Cirripedia larvae	0.24	2.27	15.00	37.57	0.41						0.37	9.22	50.00	479.62	3.08	2.90	1.79	50.00	234.53	1.66
Mysidacea											0.55	1.54	35.71	74.70	0.53	0.50	3.51	13.33	53.53	0.59
Isopoda																				
Amphipoda	0.08	2.29	5.00	11.84	0.13															
Decapoda larvae	1.91	7.83	60.00	584.53	6.39	4.60	12.49	74.00	1264.35	8.12	2.35	5.72	78.57	634.30	4.50	5.01	21.48	66.67	1765.62	19.52
<i>Jaxea nocturna</i>											0.05	0.42	7.14	3.39	0.02					
Brachyura larvae	0.48	0.79	15.00	19.04	0.21	0.27	3.19	42.00	145.04	0.93	0.77	1.79	50.00	127.92	0.91	0.17	1.02	13.33	15.76	0.17
Mollusca																				
Gastropoda											0.05	1.18	7.14	8.84	0.06					
Bivalvia											1.97	1.47	71.43	245.49	1.74					
Chaetognatha	1.91	3.50	20.00	108.15	1.18						1.91	2.25	42.86	178.47	1.27	2.59	7.69	26.67	274.13	3.03
Appendicularia	3.34	1.39	25.00	118.19	1.29						1.15	0.69	28.57	52.42	0.37	6.34	4.33	40.00	427.13	4.72
Thaliacea	0.64	3.87	20.00	90.18	0.99															
Actinopterygii																				
Fish larvae	0.32	10.21	15.00	157.91	1.73											0.08	0.47	6.67	3.68	0.04

**Table 3**  
Diet composition of red bandfish, *Cepola macrophthalmia*, in the İzmir Bay by length groups

Prey Item	10–19.9 cm (n = 60)			20–29.9 cm (n = 75)			30–39.9 cm (n = 24)			≥40 cm (n = 17)		
	%N	%W	IRI	%N	%W	IRI	%N	%W	IRI	%N	%W	IRI
Siphonophora	0.07	0.03	10.00	1.06	0.01	1.06	0.01	0.01	1.06	0.17	1.34	17.65
Anthomedusae	0.07	0.03	10.00	1.06	0.01	1.06	0.01	0.35	12.40	1.91	1.01	17.65
Polychaeta	0.05	0.82	11.67	10.10	0.09	10.10	0.09	0.04	3.95	0.04	0.95	17.65
Crustacea												
Cladocera												
<i>Podon intermedius</i>	1.79	1.90	56.67	209.19	1.77	209.19	1.77	0.63	56.53	4.26	3.38	52.94
<i>Penilia avirostris</i>												
Ostracoda	0.10	0.48	23.33	13.42	0.11	13.42	0.11	0.04	6.04	0.30	1.96	52.94
Copepoda	87.76	79.32	100.00	16707.20	95.01	16707.20	95.01	80.31	15981.54	83.59	69.50	100.00
Calanoida	16.98	3.85	100.00	2083.05	17.65	2083.05	17.65	18.90	1894.95	17.02	4.22	70.59
<i>Acartia clausi</i>	2.74	2.50	55.00	288.14	2.44	288.14	2.44	1.10	50.04	0.30	0.22	35.29
<i>Calocalanus pavo</i>										0.13	0.11	17.65
<i>Calocalanus plumulosus</i>										0.09	3.54	17.65
<i>Paracalanus parvus</i>	3.93	26.28	66.67	2013.73	17.06	2013.73	17.06	6.06	2397.82	1.22	5.75	70.59
<i>Ctenocalanus vanus</i>												
<i>Clausocalanus arcuicornis</i>	0.32	0.25	11.67	6.65	0.06	6.65	0.06	0.67	8.06	0.07		
<i>Clausocalanus furcatus</i>	0.64	1.06	36.67	62.23	0.53	62.23	0.53	0.20	10.24	0.60	0.16	0.49
<i>Clausocalanus</i> spp.	0.37	1.36	21.67	37.41	0.32	37.41	0.32	1.42	86.70	0.75	0.05	0.47
<i>Nannocalanus minor</i>	0.54	1.20	26.67	46.31	0.39	46.31	0.39	0.59	70.67	0.61	0.22	0.61
<i>Diaxius pygmaea</i>												
<i>Temora spylifera</i>	7.34	4.45	65.00	766.01	6.49	766.01	6.49	17.20	1871.77	10.34	5.58	91.67
<i>Aetideus giesbrechti</i>												
<i>Euchaeta marina</i>												
<i>Centropages typicus</i>	8.00	2.96	91.67	1004.62	8.51	1004.62	8.51	4.06	332.32	2.88	18.61	6.76
<i>Centropages kroyeri</i>	0.07	0.18	6.67	1.68	0.01	1.68	0.01	0.08	1.45	0.01	0.43	1.50
<i>Centropages violaceus</i>	0.02	1.20	6.67	8.20	0.07	8.20	0.07					
<i>Candacia ethiopia</i>	0.02	0.06	5.00	0.45	0.00	0.45	0.00	0.28	20.51	0.18	0.05	0.57
<i>Candacia armata</i>	0.07	0.82	18.33	16.47	0.14	16.47	0.14	0.51	43.78	0.38	0.87	2.15
<i>Candacia bispinosa</i>	0.02	0.07	6.67	0.65	0.01	0.65	0.01	0.08	3.26	0.03	0.43	1.47
<i>Candacia simplex</i>	0.32	1.33	15.00	24.68	0.21	24.68	0.21	0.31	19.56	0.17	0.30	1.17
<i>Candacia</i> sp.												
<i>Lucicutia flavicornis</i>	0.61	1.01	10.00	16.24	0.14	16.24	0.14					
<i>Lucicutia</i> sp.	0.02	0.10	5.00	0.61	0.01	0.61	0.01					
<i>Isias clavipes</i>	0.17	0.76	25.00	23.30	0.20	23.30	0.20	1.65	168.76	1.46	0.87	1.06
<i>Labidocera wollastoni</i>	0.05	1.34	10.00	13.91	0.12	13.91	0.12	0.35	23.15	0.20	0.05	0.79
<i>Pleuronamma abdominalis</i>	0.15	1.22	15.00	20.52	0.17	20.52	0.17	0.08	16.65	0.14	1.48	2.10
<i>Pleuronamma gracilis</i>												
<i>Corycaeus clausi</i>	1.33	1.76	35.00	108.08	0.92	108.08	0.92	0.35	30.34	0.26	0.11	0.57

Table continues on next page.





**Table 4**  
Diet composition of red bandfish, *Cepola macrophthalmia*, in the Sığacık Bay by length groups

Prey Item	10–19.9 cm (n = 78)			20–29.9 cm (n = 66)			30–39.9 cm (n = 39)			≥40 cm (n = 14)					
	%N	%W	%F	IRI	%IRI	%N	%W	%F	IRI	%IRI	%N	%W	%F	IRI	%IRI
Siphonophora	0.06	0.40	3.85	1.78	0.02										
Anthomedusae						0.07	3.00	15.38	47.18	0.34					
Polychaeta	0.24	0.17	7.69	3.21	0.04	0.04	0.04	4.55	0.38	0.00	0.63	0.41	15.38	16.04	0.11
Crustacea															
Cladocera															
<i>Podon intermedius</i>	3.31	1.69	34.62	173.05	1.92	3.33	1.82	36.36	187.42	1.86	2.80	1.41	61.54	259.05	1.88
<i>Podon polyphemoides</i>	0.06	0.17	3.85	0.90	0.01	0.09	0.25	9.09	3.01	0.03	0.07	0.17	15.38	3.73	0.03
Ostracoda															
Copepoda	93.14	87.86	96.15	17404.54	96.92	85.53	64.53	90.91	13641.70	88.84	87.76	67.14	100.00	15489.97	87.76
Calanoidea	21.00	11.76	73.08	2394.41	26.62	14.72	7.69	90.91	2037.62	20.26	14.41	8.30	100.00	2270.74	16.45
<i>Acartia clausi</i>	1.04	1.92	26.92	79.77	0.89	0.90	1.70	27.27	70.86	0.70	0.77	1.69	61.54	151.21	1.10
<i>Acartia negligens</i>	0.12	1.20	11.54	15.31	0.17	0.21	2.15	9.09	21.51	0.21					
<i>Calanus</i> sp.						0.04	0.12	4.55	0.75	0.01					
<i>Calocalanus contractus</i>															
<i>Calocalanus</i> spp.											0.07	0.10	15.38	2.67	0.02
<i>Paracalanus parvus</i>	3.43	2.70	42.31	259.17	2.88	5.85	2.52	59.09	494.55	4.92	3.71	2.89	76.92	507.68	3.68
<i>Paracalanus nanus</i>	0.49	0.80	11.54	14.92	0.17	0.55	0.49	18.18	19.04	0.19	0.63	1.07	46.15	78.33	0.57
<i>Ctenocalanus vanus</i>															
<i>Clausocalanus arcuicornis</i>	0.37	0.57	7.69	7.24	0.08	0.09	0.14	4.55	1.04	0.01	0.07	0.07	15.38	2.14	0.02
<i>Clausocalanus furcatus</i>	0.24	2.04	11.54	26.33	0.29	0.47	0.72	18.18	21.58	0.21	0.07	0.03	15.38	1.61	0.01
<i>Clausocalanus</i> spp.	2.45	3.61	38.46	233.23	2.59	0.64	0.96	54.55	87.49	0.87	1.96	1.69	46.15	168.27	1.22
<i>Nannocalanus minor</i>	0.06	0.09	7.69	1.13	0.01	0.26	1.48	13.64	23.62	0.23					
<i>Diatixis pygmaea</i>	0.06	0.03	3.85	0.35	0.00	0.04	0.02	4.55	0.29	0.00	0.28	7.51	30.77	239.67	1.74
<i>Temora stylifera</i>	4.53	6.40	46.15	504.39	5.61	2.48	2.89	63.64	341.51	3.40	7.83	9.34	92.31	1584.68	11.48
<i>Euchaeta marina</i>															
<i>Centropages typicus</i>	2.82	3.13	50.00	297.18	3.30	7.38	3.96	50.00	567.05	5.64	18.74	4.86	76.92	1815.25	13.15
<i>Centropages violaceus</i>						0.04	1.54	4.55	7.18	0.07					
<i>Candacia ethiopica</i>						0.04	0.43	4.55	2.15	0.02	0.14	1.52	15.38	25.47	0.18
<i>Candacia armata</i>	0.06	0.60	3.85	2.55	0.03						0.07	0.72	15.38	12.20	0.09
<i>Candacia bispinosa</i>	0.18	1.61	11.54	20.66	0.23	0.17	1.64	4.55	8.23	0.08	0.07	0.62	15.38	10.62	0.08
<i>Candacia simplex</i>	0.73	2.87	15.38	55.44	0.62	0.09	0.08	9.09	1.52	0.02					
<i>Candacia</i> sp.	0.06	4.13	3.85	16.12	0.18	0.09	0.78	9.09	7.86	0.08					
<i>Lucicutia flavicornis</i>	0.73	0.52	3.85	4.81	0.05	0.13	0.10	4.55	1.05	0.01					
<i>Isias clavipes</i>	0.18	0.98	11.54	13.37	0.15	0.64	0.74	27.27	37.59	0.37	0.49	1.52	61.54	123.40	0.89
<i>Pleuronamma abdominalis</i>						0.09	0.37	9.09	4.13	0.04	0.49	1.17	15.38	25.55	0.19
<i>Corycaeus clausi</i>	0.61	1.09	19.23	32.74	0.36	0.13	0.68	9.09	7.32	0.07	0.28	1.27	30.77	47.82	0.35

Table continues on next page.

Table 4 cont.

Prey Item	10-19.9 cm (n = 78)				20-29.9 cm (n = 66)				30-39.9 cm (n = 39)				≥40 cm (n = 14)							
	%N	%W	%F	IRI	%IRI	%N	%W	%F	IRI	%IRI	%N	%W	%F	IRI	%IRI					
<i>Corycaeus flaccus</i>	2.69	2.78	23.08	126.39	1.41	0.43	0.39	18.18	14.84	0.15	0.07	0.03	15.38	1.61	0.01	0.49	0.17	14.29	9.40	0.09
<i>Corycaeus giesbrechti</i>	0.67	1.06	26.92	46.71	0.52	2.43	2.36	31.82	152.43	1.52	4.55	2.48	30.77	216.17	1.57	1.83	2.33	57.14	237.99	2.20
<i>Corycaeus ovalis</i>	5.70	5.39	57.69	639.69	7.11	5.63	4.72	50.00	517.49	5.15	3.01	2.62	100.00	562.50	4.08	4.77	3.07	71.43	560.15	5.19
<i>Ditrichocorycaeus brehmi</i>	11.64	4.45	53.85	865.92	9.63	18.99	5.97	77.27	1928.69	19.18	16.50	5.37	92.31	2019.44	14.63	5.87	1.08	57.14	397.09	3.68
<i>Onchocorycaeus latus</i>	0.06	4.59	3.85	17.89	0.20	0.17	4.18	4.55	19.79	0.20										
<i>Urocorycaeus furcifer</i>	0.55	0.89	23.08	33.24	0.37	0.26	0.33	18.18	10.62	0.11	0.21	0.07	30.77	8.57	0.06	0.12	0.41	14.29	7.54	0.07
<i>Farranula rostrata</i>	11.21	4.10	61.54	942.06	10.48	10.46	3.10	77.27	1047.27	10.41	6.92	2.27	92.31	848.92	6.15	4.65	0.98	71.43	401.80	3.72
<i>Corycaeus</i> spp.											0.07	0.34	15.38	6.38	0.05					
<i>Vetтория parva</i>																				
<i>Oithona nana</i>	0.06	0.03	3.85	0.35	0.00	0.04	1.21	4.55	5.69	0.06										
<i>Oithona plumifera</i>	0.06	1.06	3.85	4.32	0.05															
<i>Oncaea media</i>	14.94	7.77	61.54	1397.89	15.54	6.96	2.77	63.64	618.86	6.15	3.29	2.14	100.00	542.24	3.93	3.67	0.78	71.43	317.46	2.94
<i>Oncaea mediterranea</i>	0.67	1.38	30.77	63.09	0.70	0.34	0.59	22.73	21.27	0.21	0.07	0.21	15.38	4.26	0.03	0.86	0.61	57.14	83.65	0.77
<i>Triconia conifera</i>	0.24	0.37	7.69	4.75	0.05						0.07	0.24	15.38	4.79	0.03	0.12	0.03	14.29	2.23	0.02
<i>Oncaea</i> spp.	0.06	0.03	3.85	0.35	0.00											0.12	0.84	14.29	13.81	0.13
<i>Lubbockia squillimana</i>																				
<i>Lubbockia aculeata</i>						0.21	1.27	4.55	6.75	0.07										
<i>Sapphirina metallina</i>	0.43	1.35	7.69	13.67	0.15	0.26	0.82	9.09	9.78	0.10	0.49	1.65	15.38	32.97	0.24					
<i>Sapphirina nigromaculata</i>						0.09	0.10	4.55	0.85	0.01										
<i>Microsetella</i> spp.	1.16	1.49	34.62	91.91	1.02	0.51	2.36	22.73	65.23	0.65	0.49	0.79	46.15	59.16	0.43	0.49	0.74	14.29	17.60	0.16
<i>Euterpina acutifrons</i>	3.74	2.93	30.77	204.97	2.28	2.52	1.23	31.82	119.27	1.19	1.61	1.31	61.54	179.53	1.30	1.47	1.08	57.14	145.60	1.35
<i>Microsetella norvegica</i>						0.04	0.86	4.55	4.11	0.04										
<i>Caligus</i> sp.	0.06	2.15	3.85	8.51	0.09	0.04	0.35	4.55	1.78	0.02	0.21	1.86	30.77	63.69	0.46	0.12	2.53	14.29	37.94	0.35
Cirripedia larvae	0.55	2.21	19.23	53.08	0.59	2.13	5.43	27.27	206.39	2.05	0.21	1.14	30.77	41.43	0.30	0.12	0.07	14.29	2.71	0.03
Mysidacea	0.06	0.49	3.85	2.11	0.02	0.30	1.87	31.82	68.88	0.68	0.56	2.51	46.15	141.88	1.03	0.73	3.14	28.57	110.73	1.03
Isopoda						0.13	0.59	4.55	3.28	0.03										
Amphipoda						0.04	2.13	4.55	9.89	0.10										
Decapoda larvae	0.92	4.45	50.00	268.25	2.98	2.22	6.83	81.82	740.24	7.36	2.94	9.68	76.92	970.52	7.03	12.71	24.70	71.43	2672.13	24.74
<i>Jaxea nocturna</i>	0.06	0.63	3.85	2.66	0.03															
Brachyura larvae	0.18	0.60	11.54	9.07	0.10	0.64	2.46	40.91	126.85	1.26	0.21	1.55	30.77	54.15	0.39	0.73	1.52	28.57	64.39	0.60
Mollusca																				
Gastropoda											0.07	2.14	15.38	33.93	0.25					
Bivalvia	0.37	0.37	7.69	5.69	0.06	0.30	0.31	18.18	11.02	0.11	0.91	0.96	30.77	57.65	0.42	1.22	0.71	28.57	55.20	0.51
Chaetognatha	0.18	0.37	19.23	10.70	0.12	2.30	6.44	22.73	198.71	1.98	0.98	1.72	46.15	124.68	0.90	2.44	3.28	42.86	245.23	2.27
Appendicularia	0.86	0.57	15.38	22.02	0.24	2.82	2.09	27.27	133.86	1.33	2.52	1.89	61.59	271.51	1.97	2.81	1.11	42.86	168.28	1.56
Thaliacea						0.04	0.45	4.55	2.24	0.02	0.21	2.27	30.77	76.41	0.55	0.49	2.97	14.29	49.46	0.46
Actinopterygii																				
Fish larvae						0.09	4.76	4.55	22.01	0.22	0.07	4.00	15.38	62.55	0.45	0.24	4.32	28.57	130.54	1.21

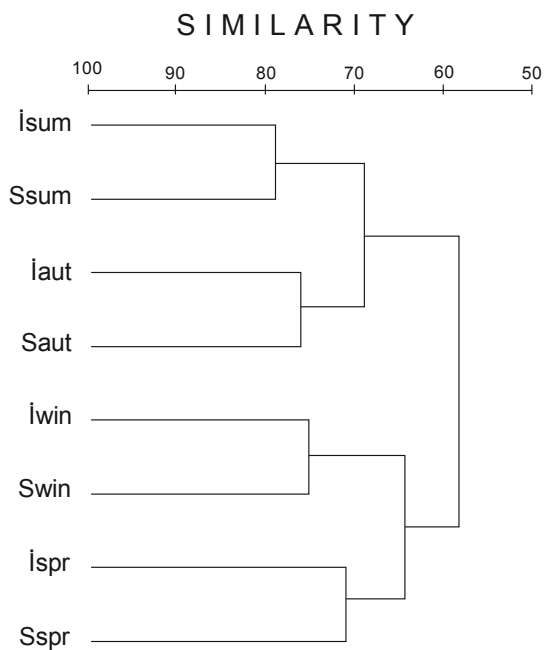
**Table 5**  
Preferred prey items of red bandfish, *Cepola macrophthalma*, according to Morato Index

S	MIS	Season				Length group			
		Spring	Summer	Autumn	Winter	10.0–19.9 cm	20.0–29.9 cm	30.0–39.9 cm	≥40.0 cm
Izmir Bay	MIP	IRI ≥ 1987.47 Copepoda	IRI ≥ 1874.97 Copepoda	IRI ≥ 2454.57 Copepoda	IRI ≥ 2400.03 Copepoda	IRI ≥ 2055.01 Copepoda	IRI ≥ 2130.03 Copepoda	IRI ≥ 2287.57 Copepoda Decapoda larvae	IRI ≥ 2911.81 Copepoda
	SP	IRI > 220.83 Appendicularia Anthomedusae	IRI > 208.33 Decapoda larvae	IRI > 272.50 Cirripedia larvae Decapoda larvae Bivalvia	IRI > 266.67 Decapoda larvae Appendicularia	IRI > 228.33 Not found	IRI > 236.67 Decapoda larvae	IRI > 254.17 Cladocera Brachyura larvae	IRI > 323.53 Cladocera Decapoda larvae Fish larvae
	OP	IRI ≤ 220.83 Decapoda larvae Thaliacea Other groups	IRI ≤ 208.33 Cladocera Brachyura larvae Other groups	IRI ≤ 272.50 Cladocera Chaetognatha Other groups	IRI ≤ 266.67 Brachyura larvae Chaetognatha Other groups	IRI ≤ 228.33 Cladocera Appendicularia Other groups	IRI ≤ 236.67 Cirripedia larvae Appendicularia Other groups	IRI ≤ 254.17 Mysidacea Cirripedia larvae Other groups	IRI ≤ 323.53 Brachyura larvae Chaetognatha Other groups
Sigacik Bay	MIP	IRI ≥ 1485.00 Copepoda	IRI ≥ 1719.00 Copepoda	IRI ≥ 2346.34 Copepoda	IRI ≥ 1410.07 Copepoda Decapoda larvae	IRI ≥ 1246.18 Copepoda	IRI ≥ 1840.99 Copepoda	IRI ≥ 2665.48 Copepoda	IRI ≥ 2185.78 Copepoda Decapoda larvae
	SP	IRI > 165.00 Decapoda larvae Cladocera	IRI > 191.00 Cladocera Cirripedia larvae Decapoda larvae	IRI > 260.70 Decapoda larvae	IRI > 156.67 Appendicularia Chaetognatha	IRI > 138.46 Cladocera Decapoda larvae	IRI > 204.55 Cirripedia larvae Decapoda larvae	IRI > 296.16 Decapoda larvae	IRI > 242.86 Cladocera Chaetognatha
	OP	IRI ≤ 165.00 Appendicularia Chaetognatha Other groups	IRI ≤ 191.00 Brachyura larvae Ostracoda Other groups	IRI ≤ 260.70 Cirripedia larvae Bivalvia Other groups	IRI ≤ 156.67 Mysidacea Cladocera Other groups	IRI ≤ 138.46 Cirripedia larvae Appendicularia Other groups	IRI ≤ 204.55 Cladocera Brachyura larvae Other groups	IRI ≤ 296.16 Appendicularia Chaetognatha Other groups	IRI ≤ 242.86 Appendicularia Fish larvae Other groups

S - sampling site, MIS = Morato Index score; MIP = main important prey, SP = secondary prey, OP = occasional prey.

*parvus* (in autumn); and *Oncaea media*, *Temora stylifera*, *Paracalanus parvus*, and *Ditrichocorycaeus brehmi* (in winter). In each bay, the diet of red bandfish for all length groups consisted of pelagic copepods as the main food item. However, the number of the decapods and teleost larvae, which are bigger prey items compared with Copepods, increased slightly along with the increasing size of the bandfish increased (Tables 3 and 4).

According to the Bray–Curtis similarity index, the diet composition of the red bandfish was similar for seasons in each bay. The similarities were found as 78.89% in summer, 75.93% in autumn, 75.02% in winter, and 70.91% in spring (Fig. 2).



**Fig. 2.** Dendrogram showing seasonal similarities in stomach contents of *Cepola macrophthalma*, based on the Bray–Curtis index (abbreviations: İ (prefix) = İzmir Bay, S (prefix) = Sığacık Bay; Suffixes: sum = summary, spr = spring, aut = autumn, win = winter)

In respect of the stomach content analysis, red bandfish fed on pelagic planktonic organisms, is a zooplanktophagous species and especially its main food item group was identified as copepods (Tables 1–5).

## DISCUSSION

There were hitherto only five studies conducted on the feeding habits of red bandfish, *Cepola macrophthalma*. Vives et al. (1959), studying this fish from Spanish waters (Ebro estuary), reported that the main food items were *Sagitta* spp., followed by copepods (especially *Calanus* spp., *Centropages typicus*, *Clausocalanus* spp., *Ctenocalanus*

*vanus*, *Pleuromamma* spp., *Scottocalanus persecans*, *Oncaea* spp., and *Corycaeus* spp.), while amphipod and decapod larvae were found only sporadically. The stomachs of bandfish from Ebro estuary contained also deep-water plankton species. Other studies—conducted by Atkinson (1976) and Atkinson et al. (1977) in the Bristol Channel (12 m of depth) and covering one and 10 fish specimens, respectively—revealed that the dominant food items were copepods (*Calanus helgolandicus*, *Centropages typicus*, *Temora longicornis*, and *Candacia armata*). Few other food items, such as euphausiids, chaetognaths (*Sagitta* spp.), copepod larvae, and red bandfish eggs were found only sporadically. Regner (1977), studying *C. macrophthalma* in central Adriatic, identified copepod eggs, copepodids, and *Oikopleura* spp. larvae as the dominant food items of the red bandfish post-larvae. According to Stergiou (1993) the diet of bandfish from the bays of Euboikos and Pagassitikos (western Aegean Sea, Greece), consisted of copepods (60.4%) and euphausiids (30.1%). The above-mentioned author also noticed seasonal differences in the fish diet. In September the most abundant were: *Clausocalanus* spp., *Acartia* sp., and *Temora stylifera*; In December—*Calanus helgolandicus*, *Eucalanus* spp., and *Clausocalanus* spp.; in March—*Calanus helgolandicus* and *Eucalanus* spp.; while in June—euphausiids.

Čakelić (unpublished\*) conducted a study on the diet of red bandfish from Adriatic Sea and reported that the dominant food item in summer were euphausiids, followed by copepods, whereas in all the remaining seasons the principal diet item were copepods.

The presently reported results on the stomach content of red bandfish were consistent with the results of the five research projects described above. The only major difference was that in the studies done by Vives et al. (1959), Stergiou (1993), and Čakelić (unpublished\*) copepods were the second dominant food item, whereas in our study pelagic copepods were dominant in all seasons. We believe that the presently reported shift towards copepods might be a result of the presumed abundance of zooplankton off the Turkish coast. This would be consistent with the results of Stergiou (1993), who concluded that, red bandfish food preference changes according to the abundance of the plankton rather than the size of planktonic organisms. According to Vives et al. (1959) and Atkinson (1977) there was a relation between the composition of zooplankton found in the stomach contents of the red bandfish and the depth they inhabit.

The prey organisms found in the stomach contents of red bandfish well reflect the species composition present at respective depths inhabited/visited by this fish (Scotto di Carlo et al. 1984, Weikert and Trinka 1990, Sever unpublished\*\*, Aker unpublished\*\*\*). Stergiou (1993) reported that red bandfish hides and rests in the cavities made by it, but subsequently it feeds in the pelagic zone.

\* Čakelić M. 2014. Sezonska prehrana i dužinsko–maseni odnos maćinca crvenog, *Cepola macrophthalma* (Linnaeus, 1758) na području južnog Jadrana. [Seasonal nutrition and length–weight relationship for red bandfish, *Cepola macrophthalma* (Linnaeus, 1758) in the southern Adriatic.] BSc Thesis. Dubrovnik University, Croatia. [In Croatian.]  
 \*\* Sever T.M. 1997. Ege Denizi Pelajik Kopepod'larının Belirlenmesi ve Önemli Türlerinin Nitel ve Nicel Dağılımları. [Establishment of pelagic copepods and quantitative and qualitative distributions of important copepod species in Aegean sea of Turkey.] PhD Thesis. Dokuz Eylül University, İzmir, Turkey. [In Turkish.]  
 \*\*\* Aker V. 2002. Türkiye'nin Orta Ege Karasuları Planktonik Kopepodlarının Mevsimsel Dağılımı. [Seasonal distribution of planktonic copepods in the Turkish coastal waters of the middle Aegean Sea.] PhD Thesis. Ege University. [In Turkish.]

In our study, the copepods were the dominant group in the stomach content, but this group was represented by meroplanktonic and holoplanktonic organisms. This fact obviously showed that bandfish feed in the pelagic zone.

Prey items in the stomach contents represented different taxa, including also rarely consumed prey items, representing Isopoda, Amphipoda, Gastropoda, and Thaliacea. Copepods were the most important prey group of bandfish and they were dominant in terms of numbers and frequency in each season and stomach. Copepods were also reported as the dominant group in each season by zooplankton studies from various region of the Aegean Sea (Moraitou-Apostolopoulou 1972, 1976, 1985, Benli et al. 2001, Özel and Aker 2004, İşinibilir 2009, Sever unpublished\*, Aker unpublished\*). Exceptionally, cladocerans were dominant group along with copepods in a seasonal and horizontal sampling study by Özel and Aker (2004). Nonetheless, frequency of Cladocera was lower in our study. This fact may be explained that Cladocera species are more abundant in surface waters than they are in the feeding areas of red bandfish (Moraitou-Apostolopoulou and Kiortsis 1973).

*Corycaeus typicus*, *Oncaea media*, *Acartia clausi*, and *Euterpina acutifrons* were found frequently in both, oceanic and neritic regions in the Aegean Sea (Sever unpublished\*). A study by Aker (unpublished\*) from the Aegean Sea also reported that *Centropages typicus*, *Oncaea media*, *Acartia clausi*, *Temora stylifera*, *Corycaeus typicus* were dominant in all seasons, while *Paracalanus parvus* was a dominant species in the winter. The most dominant copepod species of our study were: *Oncaea media*, *Corycaeus typicus*, *Acartia clausi*, *Clausocalanus arcuicornis*, *Centropages typicus*, *Ditrichocorycaeus brehmi*, *Temora stylifera*, *Paracalanus parvus*, and *Euterpina acutifrons* with various numbers in each season.

None of the previously mentioned researchers, studying feeding habits of the red bandfish, observed how the prey composition of this fish changes along with its length. Our study seems to be first providing such data. We also managed to demonstrate that the red bandfish is a zooplanktophagous species. Even though the species lives on the bottom, it prefers to feed on pelagic organisms. This fact indicates ontogenetically based food preferences of the species.

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\* See footnote on page 222.

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